Space Weather Forecast

Issued on Sunday 17 November 2024 at 12:59 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Daily Chance of Minor Radio Blackouts (R1). Slight Chance of Minor Geomagnetic Storms (G1) in first half of forecast period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Low during the past 24 hours, with a peak Common-class X-ray flare at 17/1059 UTC, which looks to have originated from a new and currently unnumbered sunspot emerging on the northeast limb. The largest sunspot in the southwest also produced a low-level Common-class flare at 16/2202 UTC.

There are currently four numbered sunspot regions on the visible disc, with two unnumbered regions. The largest remains in the southwest, however this showed a relatively open configuration and a reduction in the number of small spots, with an overall reduction in area and complexity. Other regions are magnetically simple and largely unchanged. There is a new sunspot region beginning to emerge on the northeast limb, although this is currently very difficult to analyse.

No Earth-directed Coronal Mass Ejections (CMEs) were observed over the past 24 hours in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of a slow-regime, with solar winds reaching between 330-400km/s. The number of particles was within typical background levels, but showed a step upwards around 16/2000UTC, which was perhaps a resumption of a slow regime when considered with a concurrent fall in the magnetic field. The north-south component was mostly weak throughout.

The net result of the above solar wind measures was Quiet (0-2Kp) geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a slightly higher chance of both Moderate- and Strong-class activity relative to the recent past, with the arrival of a succession of returning regions expected over the eastern solar horizon into the new UTC week.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast.

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However, there a very low possibility of a glancing CME, from a filament lift-off from the southwest quadrant, which left the Sun on the 15 Nov, this should pass well ahead of Earth's orbit early on Day 2 (18 Nov). No impacts are expected from this feature.

The geomagnetic forecast therefore solely consists of an inbound coronal hole fast wind, mooted for later in the current UTC day. There is a corresponding slight chance of G1 Minor geomagnetic storm intervals resulting, with the risk waning before midweek UTC to quiet.

Energetic Particles / Solar Radiation: There is a daily slight chance of S1/Minor solar radiation storms as the most complex sunspot region nears the western solar horizon.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	40	40	40
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	1	1	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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